Abstract Presented at International Narcotics Research Conference (INRC) July 10-15 2005, Annapolis, Maryland

OPTICAL BRAIN MONITORING OF COCAINE-INDUCED CEREBROVASCULAR AND INTRACELLULAR CALCIUM EFFECTS IN THE LIVING RAT

C Du [1], PK. Thanos [2], M. Yu[1], S. Rivera[1], H. Benveniste[1]

1) Med. Dept., Brookhaven National Laboratory, 2) Lab. of Neuroimaging, NIAAA, NIH

Objective is to optically assess the direct effects of cocaine on tissue blood flow, cerebral oxygenation and intracellular calcium in the cocaine-naïve living rat to understand the cerebrovascular effects and cellular mechanisms caused by cocaine **Method:** Six anesthetized rats were injected intravenously with 1 mg/kg cocaine. Cerebral blood volume, oxygenation and intracellular calcium were simultaneously detected from the cortical surface by optical diffusion and fluorescence spectroscopy. The physiological parameters of ECG, respiration rate, arterial pressure, PCO_2 and body temperature were monitored. **Results:** Cocaine induced the 4.1 % and 3.1% decrease in cerebral blood volume and tissue oxygenation respectively in 3-4 min after the cocaine administration when compared to baseline values. In parallel we observed a slight decrease in the mean arterial pressure. Interestingly, intracellular calcium transients were stable for 8.5-min after the cocaine administration before increasing to a maximum of $26.4 \pm 6.0\%$ at 30 min. These suggest that cocaine causes cerebral vasospasm that may lead to borderline brain ischemia or potential stroke.

Key words: Cocaine, cerebrovascular and calcium

Filename: Abstr_INRC 2005_BNL
Directory: C:\Documents and Settings\thanos\Desktop
Template: C:\Documents and Settings\thanos\Application Data\Microsoft\Templates\Normal.dot
Title: OPTICAL BRAIN MONITORING OF CEREBROVASCULAR AND INTRACELLULAR CALCIUM EFFECTS INDUCED BY ACUTE COCAINE EXPOSURE IN LIVING RAT
Subject:
Author: congwu
Keywords:
Comments:
Creation Date: 5/18/2005 12:59:00 PM
Change Number: 2
Last Saved On: 5/18/2005 12:59:00 PM
Last Saved By: Dr. Thanos
Total Editing Time: 6 Minutes
Last Printed On: 5/18/2005 1:06:00 PM
As of Last Complete Printing
Number of Pages: 1
Number of Words: 223 (approx.)
Number of Characters: 1,367 (approx.)